

Application No. 10/510,586
Amendment Dated June 12, 2006
Reply to Office Action of May 12, 2006

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-4 (Cancelled)

Claim 5 (Currently Amended) A method of detecting a leak in reciprocating machinery, the reciprocating machinery comprising at least two pistons that are driven by the reciprocating machinery in reciprocating motion to produce a flow of material, the method comprising the steps of:

identifying a fundamental frequency of the reciprocating machinery, the fundamental frequency comprising the rotational frequency of the reciprocating machinery multiplied by the number of pistons in the reciprocating machinery;

monitoring the flow of material out of the reciprocating machinery; and

detecting a leak in the reciprocating machinery by identifying a flow component of the monitored flow of material out of the reciprocating machinery that has at least one different frequency than the fundamental frequency of the reciprocating machinery.

Claim 6 (Previously Presented) The method of claim 5, wherein the flow of material out of the reciprocating machinery is monitored by means of Fourier analysis.

Claim 7 (Currently Amended) The method of claim 5, further comprising the steps of:

measuring an angular position of a crankshaft on the reciprocating machinery, and

localizing the detected leak based upon a comparison of the frequency of the flow component of the monitored flow of material out of the reciprocating machinery and the angular position of a crankshaft-angle.

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Claim 8 (Currently Amended) The method of claim 5, further comprising the steps of:
measuring an angular position of a cam on the reciprocating machinery, and
localizing the detected leak based upon a comparison of the frequency of the flow component of the monitored flow of material out of the reciprocating machinery and the angular position of a cam-angle.

Claim 9 (Currently Amended) An arrangement for detecting a leak in reciprocating machinery that has at least two pistons that reciprocate to produce a flow of material, ~~the arrangement having a fundamental frequency constituted by the rotational frequency of the reciprocating machinery multiplied by the number of pistons in the machinery~~, the arrangement comprising:

a fundamental frequency constituted by the rotational frequency of the reciprocating machinery multiplied by the number of pistons in the reciprocating machinery;

at least one measuring device arranged to measure a flow value from the reciprocating machinery; and

a computer arranged to receive the flow value from the at least one measuring device;

wherein the computer comprises a program that detects leaks in the reciprocating machinery by identifying a flow component of the flow value ~~value~~ that has a frequency that differs from the fundamental frequency of the reciprocating machinery.

Claim 10 (Currently Amended) The arrangement of claim 9, wherein the reciprocating machinery comprises a crankshaft driving the at least two pistons and further comprising a rotational angle transmitter coupled to the computer, the rotational angle transmitter arranged to measure an angle of the crankshaft.

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Claim 11 (Currently Amended) The arrangement of claim 10, wherein the computer program is capable of localizing~~arranged to localize~~ the leak associated with the identified flow component of the monitored flow of material out of the reciprocating machinery by analyzing the relationship between the frequency of the flow component of the monitored flow of material out of the reciprocating machinery and the crankshaft angle.

Claim 12 (Currently Amended) The arrangement of claim 9, wherein the reciprocating machinery comprises a cam driving the at least two pistons and further comprising a rotational angle transmitter coupled to the computer, the rotational angle transmitter arranged to measure an angle of the cam.

Claim 13 (Previously Presented) The arrangement of claim 9, wherein the reciprocating machinery comprises a pump.